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ABSTRACT

Centrally concerned with design, educational technology involves making the best possible decisions for action given a particular set of circumstances, with a body of knowledge or instructional theory for guidance. More work is needed to aid educational technologists in the three tasks of building instructional theory, developing techniques for task and learner analysis, and developing effective decision-making techniques. Although the Educational Communications and Technology Journal (ECTJ) can contribute to dissemination of information about all three tasks, there has been a tendency to publish far more articles of the instructional theory type. This is partly because reports of studies using naturalistic-research methods have not been submitted. ECTJ may be seen primarily as a journal of instructional theory, while more reports of research on design and application are needed, as well as articles dealing with the social impact of educational technology. The future of ECTJ is in the hands of Association for Educational Communications and Technology (AECT) members and the broader research and development community. Five references are listed. (LMM)

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ECTJ and Research in Educational Technology.

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AECT Annual Convention

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This brief paper will reflect upon two things. The first is educational technology research and its present state. The second is the role of ECTJ. The paper is not to be construed in any way as official Journal editorial policy, but rather as some personal reflections about where we are and where should be be going.

Dare I begin with a definition? I think it might be useful. For me, educational technology is centrally concerned with design, with, as Simon (1969) puts it, the main focus on the optimization of alternative paths of action. I do not think that this definition is in any way heretical. It is, of course, very close to a definition of technology, given by Galbraith (1967): "The systematic application of scientific or other organized knowledge to practical tasks." This definition suits me well. Galbraith and Simon are essentially saying the same thing. That we have to make the best possible decisions for action, given a particular set of circumstances; and that we have to have a body of knowledge to guide us. While this approach to what we do in our field is clearly rooted in positivism and determinism, the limitations of which are becoming increasingly apparent to educators, it is nonetheless the paradigm that, for now, continues to dominate our activities as educational technologists.

Educational technologists succeed in what they do to the extent that they have access to and understand the body of "scientific or other" knowledge that underpins our field, to the extent that they accurately analyze and understand the practical tasks they are expected to deal with, and to the extent that they are aware of and can use the "systematic" procedures that lead to the best decisions. Educational Technology is an eclectic, even better a systemic discipline in that the strength of the discipline is determined by the strength of its weakest component. In other words, without a sound body of knowledge, techniques for analysing practical tasks, or a set of optimizing procedures, the whole endeavor grinds to a halt. The weakest one of these three components will determine the strength of the entire discipline and the success of the design process.

What is the body of scientific knowledge that we apply systematically to practical tasks? My position is that it is instructional theory. However, when you consider what I believe to be valid sources of instructional theory, you will realize that my position is not as narrow as you might first have thought. Instructional theory can, of course, be built from experimentation, either directly from controlled studies of instruction, or indirectly from controlled studies of learning. Implied here is a fundamental distinction between theories of learning, which are descriptive, and theories of instruction,

which are prescriptive. On the other hand, theories of instruction can be built from naturalistic observation of what goes on when students learn and instructors teach, in classrooms or wherever. (A point to be made here is that the impending shift from experimental to naturalistic research methods, while influencing instructional theory, will not necessarily change the deterministic pratices of designers. The way in which knowledge is derived does not effect the use to which it is put.)

As the body of knowledge contained in instructional theory grows, there are two major points that are becoming increasingly clear. The first is that media and communications technologies, as delivery systems, do not make one iota of difference to learning. What do make a difference are features of the formats in which information is cast, and instructional methods, which are both mostly indepedent of media, but which both engage cognitive processes that do have an impact on learning. The second point is that, because human behavior is so utterly unpredictable, the discovery of the optimal method of instruction is well nigh impossible. We can certainly improve the ways in which we select the best method for the given circumstances. However, the chances are that this method will not apply in other situations. As Clark (1983) pointed out recently, we usually deal with sufficient conditions of learning, not necessary conditions. This, of course, points to a weakness in instructional theory in its current state. Ideally, instructional theory should embody

necessary conditions of learning. But for now we will have to make do with what we have.

In addition to instructional theory, derived from controlled experiments and from observation of learning and instruction, educational technologists also build theories of design. These are concerned with analyzing and describing the "practical tasks" faced by educational technologists, and with techniques for decision-making. Interestingly, techniques of task and learner analysis are intimately tied to developments in cognitive approaches to instructional theory. As our picture of how people learn is gradually pieced together, so our knowledge of how students learn and use algorithms and how this is affected by the skills and strategies they bring to bear, is improved. The deeper we dig into cognitive processes and skills, the harder it becomes to separate content from mental skill, task from learner analysis. Instructional research informs instructional design.

Instructional decision-making, on the other hand, is considerably complicated by advances in theory. When I look at media selection (method selection?) models, they are all extremely oversimplified in the face of what we now know about learning and instruction. I should add that, in their recent book, Reiser and Gagne (1983) recognize this, and imply that while a selection model will make life easier for designers of certain kinds of tasks, it will not make life perfect. To do

this would require that, indeed, instructional theory describe all the necessary conditions of all types of learning, a situation which is a long way off in the future, if we are ever to achieve it.

To summarize, then, we are still flying by the seat of our pants to a degree. Our three tasks of building instructional theory, of developing techniques for analysis of practical tasks, especially learners and cognitive processes, and of developing effective decision-making techniques still have a long way to go. We are at least off the ground. But we have still have to climb to cruising altitude.

ECTJ has a contribution to make in the dissemination of information about all three of our tasks. The journal publishes articles that contribute to instructional theory, either by reporting experiments or by putting forward theoretical positions. It also publishes articles on design theory, that is on how we analyze practical tasks and how we make instructional decisions. However, to date, there has been a tendency to publish far more articles of the instructional theory type than of the other types.

There are a number of reasons for this. First, there is still the perception that for purposes of promotion in universities the empirical "hard science" paper is somehow more

respectable than papers to do with practice. However, what Schon (1983) has dichotomized as "Technical rationality" and "Reflection in action" are both equally important ingredients in our profession. Unfortunately professional schools are usually low on the totem pole in universities, which means that it will take time and effort to get contributions to practice recognized as equal in value to contributions to theory.

Second is the vicious circle in which journals tend to get caught up. A journal's editorial policy is inferred mainly from what people see it publishing, and only minimally from policy statements that it prints, usually under "Instructions to authors". I think ECTJ is seen to be a place to publish articles contributing to instructional theory. This is certainly true if the proportion of manuscripts that are submitted is anything to go by. It is not that articles in the other categories (analysis, design and so on) are rejected more frequently by the reviewers. We just do not get them. I would like to add a word about articles on computer applications to education. We should be publishing papers in this area. But to date we have not received one good report of a computer study or project. I find this surprising, if not alarming. Again, I am sure this is because we are not thought of as a "computer journal".

As a final example, we have received a number of manuscripts about naturalistic research methods. However, we have not

received one good report of a study that used them! Either lots of people are talking about these methods, and no-one is doing naturalistic research. Or people are sending their manuscripts elsewhere. I suspect the latter, again because we are not seen to be the place to publish naturalistic studies. I should also add that a lot of people (until recently myself included) still consider such research to be less rigorous and of a lesser quality. There is work to be done here, and I think RTD has an important role to play.

If ECTJ is seen to be, and by virtue of that fact actually is a journal that reports mostly instructional theory, then how is it different from other journals that do this, such as JEP? I think in two ways. The first is, ironically, the residue from the "Audio-Visual" orientation that our field used to have. The research we publish tends frequently to investigate the "message format" variables of instructional theory. We carry a lot of articles on pictures, visualization, audio, and so on. So, for people who want to read about or publish a paper on how the form given to information affects learning, ECTJ is the first place to turn.

The second difference between ECTJ and other journals is the degree of emphasis given the extension of results into the design process. I have noticed that, for the most part, our authors tend to pay attention to application of their research to the

practical tasks of education. This is encouraging, because it has within it the germ of that shift from the theoretical to the practical, from "Technical rationality" to "Reflection in action", that I alluded to above. I am particularly pleased to see an author do a super job of presenting a study conducted in a "real world" setting, and saying so. Of course there is a trade-off of internal for external validity. But provided this is made known to the readers with all frankness, then I have no problem with it. As we see more naturalistic research, this matter will crop up more often.

My optimism about the future of the Journal, after almost a year as its editor, is average to above average, though not wildly positive. This note of caution has its roots in what I have just said: we are not publishing enough articles in the analysis and design categories which makes our field unique; we are not doing so because we we are not getting the manuscripts; people are not submitting the manuscripts because we are seen to be primarily a journal of instructional theory, and because papers of this type are not thought of as highly as basic research papers in academic communities. Let me add straight away that there is nothing wrong with us publishing instructional theory. I just feel that we need to publish more in design and application as well.

I have ignored the type of manuscript that we also receive

from time to time to do with the scociological aspects of our discipline. I am referring to articles on the social impact of educational technology, the whole area of innovation and change, organization and management, the history of our field, and so on. I must apologize if in leaving these areas to last I have seemed to belittle them. That is not my intention. It seems that any discipline will do well to examine itself and its impact from time to time. ECTJ must support these efforts. But again, we receive far fewer submissions of papers dealing with these topics than of papers on other topics. That is a fact over which we have little control.

As an editor, I often wish I could make people write and submit manuscripts. Of course, we have the annual review papers, funded by ERIC at Syracuse. But these do not allay my frustration. An editor can solicit, can weadle and encourage. But an editor cannot compel. The future of the Journal is therefore in the hands of the members of AECT and of the broader research and development community that feeds it. We must all encourage these consituencies to allow us to publish what it is they are up to. The journal, after all, has a responsibility to communicate to members of AECT the latest ideas and discoveries of the field. These may not be occuring under the auspices of people who think of themselves as educational technologists before all else. But they are doing work of importance to our profession and we must

pass it on to our colleagues.

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